



An Energy Efficiency Workshop & Exposition

Palm Springs, California

Please be courteous to our speakers



***Turn off all cell phones
and
Set pagers to vibrate***





An Energy Efficiency Workshop & Exposition

Palm Springs, California

*Best Practices
of
Building Commissioning*



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Palm Springs, California

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Commissioning Provides Framework for Successful Building Operations

Commissioning is a systematic process of assuring that a facility performs in accordance with the design intent and the owner's operational needs.



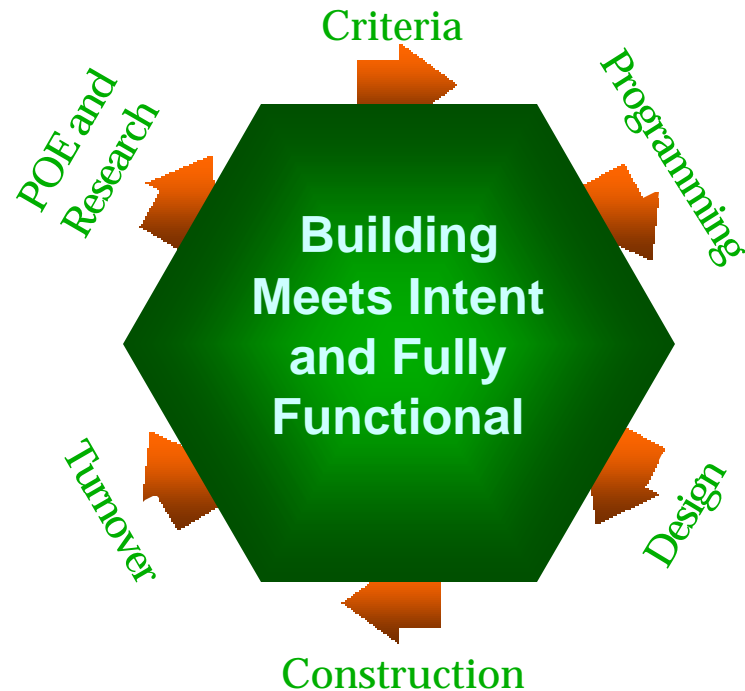
June 3, 2002

Sustainable Building Design

4



Commissioning Captures Performance Expectations





Commissioning Goes Beyond Current Practice and Catches Problems Early

- Documentation of owner objectives
- Documentation of design description
- Independent reviews (design & submittals)
- Independent construction observation
- Tracking of issues
- Checklists for contractors
- Functional performance testing
- Higher quality O&M manual and training





*Commissioning is Facilitating a Process, **Not** Fingerpointing*

- Process includes:
 - Setting a quality process in place
 - Anticipating problems
 - Working to find solutions
 - Following through issues to get results
 - Helping everyone achieve the same goal





Commissioning Activities Are Incorporated in Each Phase

□ **Pre-Design**

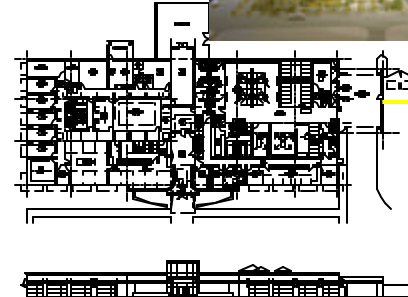
- Owner's objectives and requirements for the facility developed and documented in the design intent

□ **Design**

- Peer review of design to ensure that the building will perform as intended

□ **Construction Documents**

- Integration of commissioning requirements into the construction documents





Through Construction & Warranty Phases

□ **Construction**

- Observation and functional performance testing of equipment and systems to ensure the building delivered meets the owner's expectations



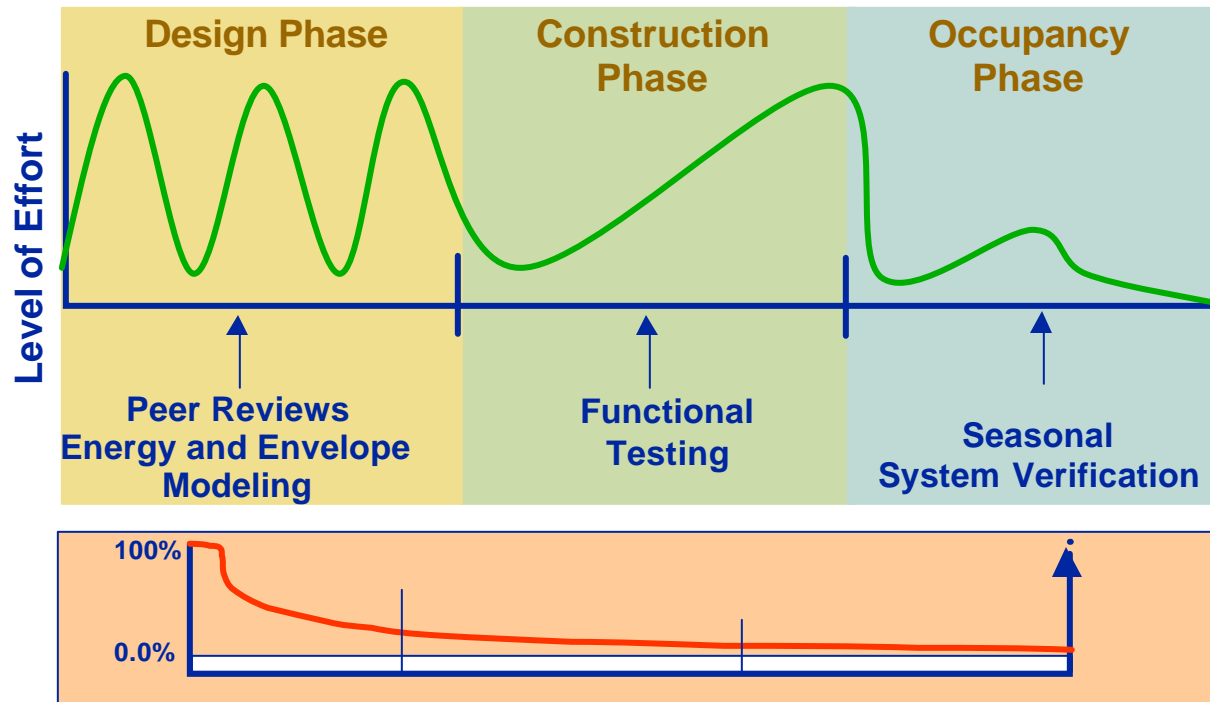
□ **Startup, Documentation & O&M Training**

- Deliver superior building documentation and training to facility staff





Specialized Services During Each Phase





Who is Performing Commissioning?

- Federal Sector
- State Governments
- Local Governments
- Universities
- Private Sector



Federal Sector



- General Services Administration
 - Numerous Courthouses Nationwide, including Seattle Courthouse
- Department of Defense
- Department of Energy
- Environmental Protection Agency



Hatfield Federal Courthouse



- 565,000 square feet
- 16 stories
- Downtown location
- \$100 M construction cost
- Occupied in 1997



U.S. Courthouse in Seattle



- 615,000 square feet
- 20 stories
- Downtown location
- \$150 M construction cost
- Design started in 1998
- Construction started in 2001
- Occupancy anticipated in Spring 2004



State Governments

- OR, WA, ID, MT
 - Commissioning Public Buildings Program
- Tennessee
 - New Construction Projects
- New York
 - Developing the Infrastructure
- Louisiana
- Florida
- Texas
- Nevada
- Utah
- New York
- Pennsylvania



Local Governments

- Montgomery County, MD
 - Commissioning program (1994-present)
- Washington County, OR
- Multnomah County, OR
- City of Seattle
- Alachua County, FL
- Numerous school districts



Ada County Courthouse



- Owner's representative
- 350,000 gsf; \$45.5 million
- Design/build project
- NW Commissioning Public Buildings Program Case Study



Universities

- Emory University
- Texas A&M
 - Continuous Commissioning
- University of South Florida
- Maryland
- California
- Illinois
- Connecticut
- Utah
- Idaho
- Oregon



Emory University



- Three new high-technology facilities
- Commissioning services provided at different project stages
- Value management
- LEEDTM certification



Private Sector

- Kaiser
Permanente
- Walt Disney
Development
- Sprint
- Boeing
(1995-present)
- Target
- J. Paul Getty
Museum
- Hewlett
Packard
- Chevron
- Westin Hotels